

Associations of adipose and muscle tissue parameters at colorectal cancer diagnosis with long-term health-related quality of life

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Quality of Life Research

Supplementary Table 1. Mean differences^a in long-term health-related quality of life outcome scores^b in colorectal cancer survivors according to tertiles of area of visceral and intermuscular adipose tissue, mean muscle attenuation, and skeletal muscle index (SMI) at colorectal cancer diagnosis, stratified by gender

	Global quality of life		Physical functioning		Role functioning		Social functioning		Disability		Fatigue		Distress	
	MD	95% CI	MD	95% CI	MD	95% CI	MD	95% CI	MD	95% CI	MD	95% CI	MD	95% CI
Visceral adipose tissue (cm ²) ^c														
Total group (n=98)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	-7.6	-15.7, 0.6	-4.4	-14.8, 6.0	-2.0	-15.2, 11.2	-2.9	-11.3, 5.5	5.0	-3.0, 13.1	8.0	-5.8, 21.9	1.3	-1.8, 4.5
T3	-5.0	-15.3, 5.3	-4.2	-17.4, 9.0	1.3	-15.5, 18.1	-4.8	-15.5, 5.9	1.7	-8.5, 11.9	11.8	-5.8, 29.4	2.9	-1.1, 6.9
P _{trend}	0.33		0.52		0.88		0.37		0.73		0.18		0.16	
Per SD increase	-1.2	-5.7, 3.3	2.6	-3.1, 8.2	4.0	-3.2, 11.2	0.8	-3.9, 5.4	-0.3	-4.8, 4.1	0.5	-7.2, 8.2	0.9	-0.8, 2.7
Visceral obesity ^d	2.3	-5.4, 10.1	4.0	-5.7, 13.7	8.6	-3.6, 20.8	-0.9	-8.8, 6.9	-2.3	-9.9, 5.2	0.7	-12.4, 13.7	-0.4	-3.4, 2.6
Men (n=56)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	-3.8	-14.0, 6.3	-0.3	-13.6, 13.0	4.4	-11.6, 20.4	-3.7	-16.0, 8.6	1.8	-8.1, 11.8	-2.2	-20.8, 16.4	-0.1	-4.5, 4.3
T3	-3.8	-16.2, 8.5	-3.7	-19.9, 12.6	3.8	-15.7, 23.4	-6.2	-21.2, 8.8	3.7	-8.4, 15.7	8.2	-14.5, 30.8	2.4	-3.0, 7.7
P _{trend}	0.52		0.65		0.68		0.40		0.54		0.49		0.39	
Per SD increase	-0.8	-6.0, 4.4	0.8	-5.9, 7.6	4.0	-4.1, 12.1	-0.2	-6.5, 6.1	1.6	-3.5, 6.8	0.4	-9.2, 9.9	0.4	-1.9, 2.7
Visceral obesity ^d	-0.4	-9.3, 8.5	1.7	-9.9, 13.3	3.9	-10.0, 17.9	-3.8	-14.5, 6.9	-0.8	-9.4, 7.9	5.5	-10.8, 21.7	-0.2	-4.0, 3.7
Women (n=42)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	-9.8	-25.2, 5.6	-11.3	-30.2, 7.6	-15.4	-40.8, 10.1	-1.5	-13.3, 10.3	12.1	-4.0, 28.2	29.1	6.2, 52.1	4.2	-1.0, 9.4
T3	2.0	-21.2, 25.2	-7.5	-36.0, 21.0	-9.1	-47.4, 29.2	-0.1	-17.9, 17.7	2.4	-21.8, 26.6	31.4	-3.2, 66.1	4.8	-3.0, 12.6
P _{trend}	0.94		0.56		0.59		0.98		0.80		0.07		0.20	
Per SD increase	1.2	-12.5, 15.0	-1.1	-17.4, 15.2	-0.0	-22.0, 22.0	3.8	-6.1, 13.6	-1.9	-16.0, 12.1	11.8	-9.4, 32.9	2.9	-1.5, 7.3
Visceral obesity ^d	13.2	-3.2, 29.5	7.6	-12.4, 27.6	15.9	-10.7, 42.5	8.2	-3.7, 20.1	-6.3	-23.5, 10.9	-2.9	-29.4, 23.7	0.1	-5.5, 5.7
Intermuscular adipose tissue (cm ²) ^c														
Total group (n=96)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	-2.3	-10.0, 5.4	-3.5	-13.2, 6.3	-4.9	-17.1, 7.3	2.0	-5.9, 9.9	5.2	-2.3, 12.7	0.6	-12.4, 13.7	0.8	-2.1, 3.8
T3	-2.6	-11.5, 6.3	-2.0	-13.2, 9.2	-2.8	-16.9, 11.3	3.3	-5.8, 12.4	3.3	-5.4, 12.0	-1.2	-16.5, 14.1	1.9	-1.5, 5.3
P _{trend}	0.54		0.69		0.66		0.46		0.40		0.89		0.27	
Per SD increase	-0.9	-5.0, 3.1	-1.1	-6.2, 4.0	-1.3	-7.8, 5.1	2.1	-2.1, 6.2	0.1	-3.9, 4.2	0.1	-6.8, 7.1	1.1	-0.5, 2.6
Men (n=55)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	0.5	-10.1, 11.1	-8.9	-22.3, 4.5	-2.1	-18.5, 14.2	7.4	-5.2, 20.0	10.0	0.2, 19.8	2.1	-17.6, 21.7	0.9	-3.8, 5.5
T3	1.6	-11.3, 14.5	0.2	-16.1, 16.5	9.8	-10.1, 29.6	9.4	-5.9, 24.8	3.6	-8.3, 15.5	-0.0	-23.8, 23.8	1.1	-4.5, 6.7
P _{trend}	0.80		0.99		0.33		0.22		0.56		1.00		0.70	
Per SD increase	2.6	-3.1, 8.2	1.9	-5.5, 9.3	5.9	-2.9, 14.7	3.7	-3.1, 10.6	-0.6	-6.1, 4.9	-1.5	-12.0, 9.1	0.6	-1.8, 3.1
Women (n=41)														
T1	ref		ref		ref		ref		ref		ref		ref	
T2	0.3	-13.7, 14.2	7.3	-9.1, 23.7	-0.2	-21.7, 21.2	2.1	-7.9, 12.1	-3.8	-18.0, 10.4	-1.6	-23.2, 20.1	0.5	-4.1, 5.1
T3	-3.5	-18.2, 11.2	-3.6	-20.8, 13.7	-12.4	-35.1, 10.2	2.5	-8.0, 13.1	4.1	-10.9, 19.1	-4.0	-27.8, 19.8	1.9	-3.0, 6.7
P _{trend}	0.65		0.79		0.30		0.60		0.66		0.73		0.44	
Per SD increase	-3.2	-10.4, 4.0	-3.8	-12.4, 4.8	-7.9	-19.0, 3.2	2.8	-2.3, 7.9	1.7	-5.8, 9.3	1.0	-10.7, 12.6	1.2	-1.2, 3.6

Muscle attenuation (HU) ^c													
Total group (n=96)													
T1	ref		ref		ref		ref		ref		ref		ref
T2	0.5	-8.1, 9.2	-4.3	-15.1, 6.6	-1.6	-15.4, 12.1	-0.6	-9.4, 8.2	0.4	-8.4, 9.2	3.7	-11.0, 18.3	-0.9
T3	-2.4	-11.6, 6.7	1.2	-10.3, 12.7	-2.9	-17.5, 11.6	-4.4	-13.7, 5.0	-1.6	-10.7, 9.2	2.7	-13.1, 18.5	-2.3
P _{trend}	0.57		0.76		0.69		0.33		0.71		0.76		0.18
Per SD increase	0.0	-3.9, 3.9	0.9	-4.0, 5.9	-1.1	-7.4, 5.1	-2.5	-6.5, 1.4	-0.8	-4.7, 3.0	-0.6	-7.6, 6.4	-1.1
Men (n=55)													
T1	ref		ref		ref		ref		ref		ref		Ref
T2	6.3	-5.3, 18.0	2.8	-12.6, 18.1	5.1	-13.4, 23.6	-2.7	-17.0, 11.6	-12.7	-23.8, -1.5	-2.5	-24.3, 19.4	-4.1
T3	0.7	-11.2, 12.5	4.8	-10.9, 20.4	-2.7	-21.5, 16.1	-5.8	-20.3, 8.8	-12.4	-23.6, -1.2	2.6	-19.7, 24.8	-4.7
P _{trend}	0.96		0.54		0.69		0.42		0.05		0.77		0.10
Per SD increase	-0.9	-6.7, 4.8	1.9	-5.5, 9.4	-3.7	-12.6, 5.3	-3.4	-10.2, 3.5	-5.0	-10.5, 0.5	0.7	-9.9, 11.3	-2.4
Women (n=41)													
T1	ref		ref		ref		ref		ref		ref		ref
T2	-5.8	-20.4, 8.7	-15.6	-32.3, 1.1	-7.3	-30.3, 15.7	1.6	-8.8, 12.0	13.2	-1.4, 27.8	10.9	-12.3, 34.0	1.6
T3	-7.3	-23.4, 8.7	-6.7	-25.1, 11.7	-3.9	-29.3, 21.5	-3.2	-14.6, 8.3	9.2	-6.8, 25.2	6.0	-20.5, 32.5	0.3
P _{trend}	0.36		0.56		0.78		0.54		0.30		0.70		0.94
Per SD increase	-0.3	-6.6, 6.0	-0.9	-8.4, 6.6	-0.0	-9.9, 9.8	-3.0	-7.4, 1.3	2.2	-4.3, 8.6	-1.4	-12.6, 9.7	0.1
SMI (cm ² /m ²) ^c													
Total group (n=96)													
T1	ref		ref		ref		ref		ref		ref		ref
T2	0.6	-7.2, 8.5	3.5	-6.5, 13.4	6.1	-6.4, 18.7	-2.0	-10.1, 6.1	-3.2	-11.1, 4.6	2.2	-11.3, 15.7	-0.3
T3	3.7	-5.3, 12.7	4.8	-6.6, 16.1	4.9	-9.4, 19.2	1.2	-8.1, 10.4	-5.9	-15.0, 3.1	-3.5	-18.7, 11.7	-0.4
P _{trend}	0.42		0.40		0.48		0.82		0.19		0.65		0.82
Per SD increase	3.0	-1.5, 7.6	2.8	-2.9, 8.6	3.6	-3.7, 10.8	0.1	-4.6, 4.8	-4.6	-9.1, 0.0	-4.4	-12.1, 3.4	-0.7
Sarcopenia ^e	-3.3	-10.4, 3.8	-1.6	-10.4, 7.1	-1.1	-12.0, 9.7	2.3	-4.3, 8.8	2.3	-4.8, 9.4	-1.6	-13.4, 10.2	2.1
Men (n=55)													
T1	ref		ref		ref		ref		ref		ref		ref
T2	2.0	-8.3, 12.2	2.4	-11.0, 15.7	4.6	-11.3, 20.6	0.2	-12.2, 12.6	-3.3	-13.2, 6.5	4.1	-14.8, 23.0	3.0
T3	-0.9	-12.4, 10.5	-1.0	-15.9, 13.9	-3.4	-21.3, 14.4	-2.2	-16.1, 11.7	0.2	-10.8, 11.2	2.7	-18.5, 23.9	3.2
P _{trend}	0.89		0.90		0.73		0.76		1.00		0.79		0.17
Per SD increase	2.6	-3.0, 8.2	1.3	-6.1, 8.7	-0.4	-9.3, 8.5	-0.8	-7.7, 6.1	-2.6	-8.1, 2.8	-3.2	-13.6, 7.3	0.4
Sarcopenia ^e	-5.8	-15.2, 3.6	-4.0	-16.2, 8.2	1.2	-12.7, 15.0	0.9	-9.4, 11.2	1.5	-7.8, 10.7	3.9	-13.3, 21.1	1.0
Women (n=41)													
T1	ref		ref		ref		ref		ref		ref		ref
T2	-2.3	-16.6, 12.0	2.9	-14.2, 20.0	4.3	-18.4, 27.1	-7.1	-17.1, 2.9	-3.5	-19.0, 12.0	5.7	-16.3, 27.7	-3.0
T3	8.0	-8.8, 24.8	12.4	-7.7, 32.5	11.3	-15.4, 38.0	0.8	-11.0, 12.6	-14.4	-33.5, 4.7	-13.7	-38.7, 11.3	-5.1
P _{trend}	0.41		0.23		0.39		0.92		0.14		0.34		0.05
Per SD increase	3.6	-5.2, 12.4	5.6	-4.9, 16.1	8.3	-5.4, 21.9	-0.4	-6.8, 5.9	-7.5	-17.8, 2.7	-6.1	-19.9, 7.7	-2.4
Sarcopenia ^e	0.2	-12.7, 13.0	-3.1	-18.5, 12.3	-5.1	-25.2, 15.0	5.2	-3.8, 14.2	4.4	-9.8, 18.5	-1.9	-21.8, 18.0	3.5

Abbreviations: CI, confidence interval; HU, Hounsfield units; MD, mean difference; SD, standard deviation; T, tertile.

^aAdjusted for: age at diagnosis (years), body mass index at health-related quality of life assessment (kg/m²), number of comorbidities (0/1/2+), cancer stage (I/II/III), and chemotherapy treatment (yes/no).

^bScales are 0-100 (global quality of life, physical, role and social functioning, and disability), 20-140 (fatigue), and 0-21 (distress), with higher scores indicating higher global quality of life, physical, role and social functioning, disability, fatigue, and distress. A total of 3 participants had missing data for disability, 2 for fatigue, and 1 for distress. Defined minimal important differences for these subscales are: global quality of life, 10; physical functioning, 14; role functioning, 19; social functioning, 11; disability, 7.7; fatigue, 23.3; and distress, 3.1.

^cWith gender-specific tertiles for visceral adipose tissue (men: T1, ≤100.3; T2, 102.7-196.5; T3, ≥199.2; women: T1, ≤58.7; T2, 59.2-131.0; T3, ≥139.1 cm²), SMI (men: T1, ≤48.6; T2, 48.8-53.8;

T3, ≥ 54.0 ; women: T1, ≤ 38.7 ; T2, 38.7-43.9; T3, $\geq 44.3 \text{ cm}^2/\text{m}^2$), and intermuscular adipose tissue (men: T1, ≤ 8.3 ; T2, 8.8-14.2; T3, ≥ 14.3 ; women: T1, ≤ 9.6 ; T2, 9.7-17.8; T3, $\geq 17.9 \text{ cm}^2$), and overall tertiles for muscle attenuation (T1, ≤ 33.6 ; T2, 33.6-41.6; T3, ≥ 42.0 Hounsfield units).

^dDichotomized based on published cutoff for visceral adipose tissue area.[1]

^eDichotomized based on published cutoff[2]; data missing for 9 participants due to missing data on body mass index at colorectal cancer diagnosis.

Reference

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